The Bulletin

OF THE

South Indian Medical Union.

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PUBLICITY SECTION.

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BULLETIN
OF THE
SOUTH INDIAN MEDICAL ASSOCIATION.

JULY 1932.

Hospitalization.

Great efforts have been made by the Government of Madras within the last twenty years to provide greater facilities for medical relief in the province. One of the chief measures has been the construction of new and bigger hospitals to replace the cramped and almost obsolete ones in the head-quarters of some of the districts and taluks. In the Presidency town itself two old hospitals have been replaced by splendid institutions which together could accommodate about five-hundred patients. Special hospitals like the tuberculosis hospital and infectious diseases hospitals have been newly created. The Ophthalmic Hospital and the hospitals for women and children have been enlarged. In addition to these institutions established and managed by the Government and local bodies, there is a large number of hospitals built and run by missionary bodies, and other philanthopists. In spite of all these improvements and extension, there is great pressure still for beds in almost all institutions in the city and outside.

The trend in other countries is to provide greater facilities of hospitalization for the middle and well-to-do classes. The profession in those countries encourages this tendency as it considers that hospitalization is advantageous to the patient while it economizes the time and energy of the medical attendant. Most of the hospitals there are private institutions, *i.e.*, institutions founded and managed by private individuals or societies. But in India, most of these hospitals are established and controlled by the Government. If therefore the growing demand is to be adequately met, it would devolve chiefly on the Government to build and equip more such hospitals. No Government elsewhere has attempted doing such a thing. It would not be possible for this country to undertake such a task. At any rate for the present and the near future, the financial strait is an effective block. Now is therefore the time to review the situation as regards the needs of the public and to see if the existing hospitals are being utilized to the best advantage and to their utmost possibilities.

The desire of the public and the profession in other countries for hospitalization refers only to such cases requiring the advantage of complete and elaborate equipment available only in hospitals. The rest of the patients are generally looked after by well organized out-patient clinics. Conditions in India are at present greatly different. Patients are often admitted into hospitals, not because they could not be well looked after at the out-patient clinic, but for other reasons. Walking patients, *i e.*, those whose ailments are not of a kind requiring stay in bed, skilled nursing and repeated observation, are often admitted as in-patients since they happen to come from long distances or because they are probably homeless. If such patients could be kept out of the first class hospitals, the superior and fuller equipment of these institutions would be available to a much larger number of seriously-ill people. Thus while keeping down the expense, the Government would actually enlarge its helpfulness to the sick public.

There is another factor which increases the call on accommodation

in the city hospitals. Many patients who could be treated quite satisfactorily in the district hospitals seek admission into the institutions in the city, not because skilled help is not available in their own districts, but often on account of the lack of facilities like hotels or choultries where the patients' relatives could lodge and board while the patient himself is in the hospital. If such amenities could be created in the district headquarters more people would prefer the district hospitals to long sojourn in the city. This is not in the province of the Government. But it is an eminent field for individual or group philanthropy.

The other class of patients, *viz.*, the walking patients, while they are an unnecessary tax on first class hospitals, do require some sort of medical attention. They could he housed in third class institutions and looked after by a very small staff of medical men. One visiting physician and a resident junior officer, a number of ward orderlies with probably a nurse or two would be enough for about two hundred patients. An ordinary diet-kitchen, a well equipped pharmacy, and the necessary sanitary staff would complete the equipment. Further a number of patients suffering from chronic ailments for which little in the way of active treatment could be rendered in hospitals might more usefully be referred to these institutions which could thus serve the purpose of infirmaries.

We are aware of some of the objections that might possibly be advanced against our suggestion. Those of us, who have been so long used to existing state of things, are generally unwilling to consider any departure unless it advertises improvement. And improvement in hospital facilities is generally understood at present to be reflected in the construction of huge buildings with stately columns, marble floors, mirrored halls, and slippery landings. They should be furnished with ivory bedsteads covered with snow white damask. And they should be staffed with flitting angels ministering to ill-clad patients. Judged by these standards, our suggestion would be condemned as an anachronism. But this is a land of anachronisms where the Gypsy Moth overlooks the stately limousine jostling with the single bullock cart on one side, and the three-man power waggon on the other. And till the wealth of this country so increases that the limousine drives out of existence its humbler predecessors, the modest chapel is as essential as St. Peter's, and more people will take their votive offerings to the thatch shed of the village deity than to the summit of the Seven Hills.

It might be said that the poor would be denied the airy comfort and the cheery atmosphere of a modern hospital. We venture to think that the average patient would prefer the hostel-freedom of these third class institutions where he can wear his own clothes and be free from the many necessary restrictions incidental to big institutions where people suffering from serious ailments are looked after. The homeless vagrant would not be less happy because he misses the spring bedstead. He gets his diet, he gets his drug. He is clothed and he has lodgings till he gets well and he would probably like this place better since he may be allowed to stay here a few days longer. Richer people who may suffer from ailments of third-rate severity might not care to be treated in these hospitals. Their wealth would easily allow them to patronize private nursing homes. The best institutions in the city of Madras are utilized for teaching purposes. The housing of the walking patients separately might restrict the scope of practical experience to the students. This could be easily overcome by making these new places available for purposes of teaching and demonstration.

GENERAL NOTES.

We are glad to learn from the local dailies that the Government has passed orders on the recommendations of the Committee appointed last year to consider the revision of rules governing the *Honorary Medical Scheme.* We do not know what the actual order is, but we are told that the Government has generally approved of the recommendations of the committee. Certain details of these recommendations as published at the time were not agreeable to the medical and lay public. We hope that the Government has taken due note of those criticisms in passing their final orders.

* * *

A fairly long list of honorary appointments was published in the papers last month. We sincerely congratulate the Government on the readiness with which they have put into action their new policy of accelerating the *Honorary Scheme.* This augurs well for the future. These appointments have been generally well received by the profession and the public. In these circumstances it would be captious to criticize the details. But we would be amiss if we do not mention here the disappointment of the discerning public that more honoraries have not been appointed to the various hospitals in the city.

* * *

It is certainly noteworthy that no honorary appointment has yet been made to the surgical department of the Government General Hospital, nor to the junior ranks of the Government Hospital for Women and Children. We detect here a certain amount of nervousness on the part of the authorities. But it does not require much intelligence to predict that the Surgeon-General who is keenly interested in the progress of the profession and the Hon'ble Minister who is greatly concerned about rapidly increasing the facilities of Medical relief to the public would together soon set about to rectify these glaring defects.

* * *

It has been recently announced that the Government has sanctioned the appointment of a full-time professor of Medical Jurisprudence. Lest people should complain that there is not enough work for a full-time teacher in the Madras College, further work is found for him in the Royapuram Medical School. And as an apology for the creation of a new office with the cry of retrenchment loud on the lips the government propose to abolish two assistant surgeonships in the provincial cadre. This procedure might agitate the minds of the junior ranks in the service, but it is severely in accord with the orthodox notions of retrenchment, *viz.*, sacking the ranks and creating officers.

* * *

We hear various rumours about the selection of the person for the chair. The present professor is considered by the authorities to be one of the best in the provincial service. When it was proposed to transfer him from a district some years ago, the public sent a monster petition to the government against the transfer as they were unwilling to lose the services of so eminent a physician. Now we believe that the government is anxious to utilize his services before his impending retirement to organise this new department. Hence the urgency of the new appointment.

* * *

There does not appear to be any truth in the rumour that this post has been sanctioned to provide for a favourite professor who has recently been unseated. On the other hand, it seems that the government is going

to offer this new chair to an eminent toxicologist and jurist who is said to be at present engaged in the production of an original work on the subject We regret we are unable to satisfy the curiosity of our readers as to the identity of this eminent individual. Nevertheless there is cause for pride, since the gentleman is said to be a local one.

* * *

The medical department of the Government has evidently been very active during the last few weeks. We have already referred to its decision about the Report of the Honorary Committee, and the new appointments to various hospitals. Recently the Honourable the Chief Minister announced that it had been decided to advertise the posts before appointing honorary medical men. This is very welcome news. The Union is glad that its views have been well received by the Government.

* * *

The All-India Medical Council Bill has successfully prodded the All-India Licentiates' Association out of its long slumber. Sudden awakening after heavy sleep is often followed by a short phase of confusion. We are afraid we detect some signs of timid half-stare in the recent activities of the local branch. In its demands for reforms of medical education, it still talks in the language of two decades ago. It talks of improving the L.M.P. standard. It talks of raising the course to five years. And it silently approves of the two-standard medical education. We hope that it would soon put forth the vigorous demand for a one-standard medical education and that the best possible.

* * *

The Government has very promptly conceded to the request of the students of the medical schools and the Licentiate Association by raising the pass marks to 50 per cent. All those concerned in bringing about this happy result are to be sincerely congratulated. Reading the same text books, getting the same percentage of marks, even though it be in a test of a different standard, should tend towards greater mutual regard.

* * *

It would be unfair if we do not mention the admirable attitude of the students of the medical schools. Students all over, generally, look forward to and welcome changes that would help them to get over examinations with a little less exertion. Here is almost a unique instance of students demanding that the examinations should be more difficult. We take our hats off to them !

* * *

Just a word of caution to the students. The same text books, similar droning of lectures and the staging of demonstrations, the same percentage of marks in examinations conducted with equal ostentation ; well let us have the same percentage of passes ! False logic, we admit. But some of their chief friends, in their excessive enthusiasm might be tempted into such fallacies. Let the students take heed in time.

* * *

The Superintendent of the Royapuram Medical School has let his students down very badly. We do not know what he actually meant. But his words convey the impression that his students do not exert themselves fully in their studies. If he really meant it, we strongly protest against such statement. Those who have had anything to do with that school would fully bear with us when we say that the students of that school are second to none in their hard work, both in the school and in

the wards, in their keenness in sports and in their desire to please their teachers.

* * *

Major Mahadevan has evidently some naive theories about examinations. According to him if the minimum required for a pass in examination is 50 per cent, the student only puts forth 50 per cent of his efforts at learning. Since it is greatly desired by all that students should put forth their best endeavour in their educational career, would he advise therefore that the minimum should be fixed at 100 per cent ? Why be satisfied with less !

* * *

There is evidently a grievance that the members of the independent profession who were on the Honoraries Committee did not correctly represent the views of the profession. We understand that this feeling has particular reference to the members who represented the Licentiates. All that we can say about this is that Dr. U. Rama Rao who was one of the two members has subsequently been elected as the President of the All-India Licentiates' Association of Madras. Is it possible to get a clearer expression of the confidence that the members have in their representative ?

UNION NOTES.

The Annual meeting of the union was held on Monday the 18th July at 32, Broadway, Madras.

The members present spent a pleasant half-hour at conversation and tea. The business of the evening commenced with Dr. S. Rangachari, the President, in the chair. The Secretary presented the annual report, which is published elsewhere in this issue. The report as presented was passed and adopted.

Dr. T. Satakopan then proposed that Dr. S. Rangachari, who has done great services to the union, be re-elected President. Dr. U. Venkat Rau seconded the proposition. The house carried the proposition with acclamation.

Of the three names nominated for vice-presidentship, *i.e.*, Drs. U. Rama Rau, M. Subramania Iyer and E. V. Srinivasan, Drs. U. Rama Rau and E. V. Srinivasan were duly elected.

Dr. Mrs. Jacob having expressed her inability to continue as secretary, the two candidates nominated *viz.*, Drs. C. R. Krishnaswami and U. K. L. Narayana Rau were duly declared elected.

The following members were elected to serve on the Governing Body of the Union :—

Dr. T. Satakopan.
„ K. Srinivasa Rau.
„ V. D. Nimbkar.
„ M. Sanjiva Rau.
„ P. Rama Rau.
„ M. Subramania Iyer.
„ U. Venkat Rau.
„ K. C. Paul.
„ G. Zachariah.
„ P. Mitchell.
„ Mrs. L. Jacob.
Major M. R. Grandhi.

After the election of office bearers was over, the meeting proceeded to consider the draft rules of the Union.

The amendment to article 8 section 3 proposing that the subscription for the city members be reduced from Rs. 10 to Rs. 6 was negatived.

The second amendment of Dr. U. K. L. Narayana Rau to substitute the word 'general' for 'annual' in article 9, section 2, was carried.

The third amendment of the same gentleman to substitute '6' for '3' months in section 4 of Chapter 1 was also carried. His amendment to section 3 of Chapter 4 "That the quorum for the General Body Meeting shall be 20 and not 30, whether it be ordinary or special" was thrown out. The Bye-laws with the above amendments as carried out in the meeting were passed.

Dr. M. Sanjiva Rau proposed

"In view of the inadequacy of facilities afforded for Post Graduate Studies in various branches and specialities of Medicine and Surgery, a committee of three members be elected to report on this subject."

Having been duly seconded, this was put to vote and carried.

Having agreed to have only three members on that committee the following gentlemen were elected to serve on that body :—

Dr. T. Satakopan.

,, M. Subramania Iyer.

,, K. C. Paul.

The resolution of Dr. K. Venkat Rau

"That the Secretaries shall cause a detailed publication of all business transactions and other resolutions and discussions of the Governing Body and clinical meetings in every issue of the Bulletin in full, except in such cases when the Governing Body shall treat the matter as confidential" was carried.

With a vote of thanks to the chair the meeting came to a close.

SOUTH INDIAN MEDICAL UNION, MADRAS.

Annual Report for the Year ending March 1932.

The membership of the Union continues to be steady as in last year.

The financial statement as certified by the auditor is herewith appended.

Work.—We are glad to note the unabated interest which the members were taking in the clinical meetings of the Union and the keenness with which they entered into the discussion which usually followed the lecture.

The following papers were read before the Union :—

(1) 13th April 1931 "The treatment of Pulmonary tuberculosis" By Dr. S. Krishnaswami, Hony. Assistant Surgeon, The Tuberculosis Hospital.

(2) 8th June 1931 "X-ray examination of the heart and the great blood vessels" By Dr. P. Rama Rao.

(3) 24th August 1931 "Some Weird Experiences" By Dr. S. Rangachari.

(4) 28th September 1931 "Tonsilectomy and its indications" By Dr. C. V. C. Rau.

(5) 5th October 1931 "Hepatic disturbances" By Dr. K. C. Paul, Hony. Physician, Government Rayapuram Hospital.

(6) 12th January 1932 "Newer methods of X-ray diagnosis of gastro-

intestinal troubles" By Dr. P. Rama Rau.

(7) 8th February 1932 "The medical treatment of gastric and duodenal ulcers" By Dr. P. Govinda Rau.

All the clinical as well as the governing body meetings were held at Dr. E. V. Srinivasan's Surgery, and our sincere thanks are once again due to him for his generosity in allowing us the use of his premises.

General Meetings.—Two general meetings were held during the year. The proposed All-India Medical Council Bill with its various clauses were considered at these meetings and we are proud to feel that our opinions have found acceptance at the hands of similar bodies elsewhere.

Governing Body meetings.—Five governing body meetings were held during the course of the year and the thanks of the Union are due to those of the members who were regular in their attendance and who guided the affairs of the Union by their wise counsel.

Social.—There were three socials held during the year. Dr. S. Rangachari, the President, and Dr. U. Rama Rao, one of the Vice-Presidents, and the members of the Governing body were at home to the members on three different occasions. The great influence of these gatherings in bringing the members together and promoting the cordiality and good followship amongst the rank and file of the profession cannot be over-estimated. The secretaries are very proud to feel that these socials took place without any encroachment on the finances of the Union.

The expenses and certain technical difficulties stood in the way of giving effect to the resolution authorizing the change of the name of the Union into "The South Indian Medical Association." Fortunately other organization whose abbreviation name was similar to that of the Union have changed their name and thus obviated our difficulty.

Bulletin.—The Bulletin, the official organ of the Union, is maintaining its circulation and its usefulness to the profession and the public. We are sorry to lose the services of Dr. T. Krishna Menon who was the efficient publisher of this organ ever since its inception, owing to his absence in the continent but Dr. M. Subramania Iyer who has stepped into the breach and is carrying on the work of the Bulletin in spite of his multifarious activities has allayed our anxiety with regard to this Journal.

The financial stringency of the business world has manifested itself by diminished income from advertisement; but increasing membership of the Union and greater demand for the Bulletin because of its usefulness to the profession has naturally stimulated our optimism with regard to this organ.

The Union offers its sincere thanks to the various members of the publicity section for their ungrudging services in maintaining the high standard of the Bulletin. The Union is proud to feel that its agitation has resulted in increased honorarization of the various hospitals in the presidency and the Union takes this opportunity of expressing their great appreciation of the very sympathetic attitude of the Surgeon-General and the Government in this matter.

We therefore naturally hope that with our growing influence we would ere long be able to take our rightful place in the body politic and continue to discharge our duties to the profession and public.

THE SOUTH INDIAN MEDICAL UNION, MADRAS.

Statement of receipts and disbursements for the year ending 31st March 1932.

RECEIPTS.	RS. A. P.	RS. A. P.	PAYMENTS.	RS. A. P.	RS. A. P.
To Balance as on 31-3-1931			By Establishment ...		319 0 0
With the Indian Bank Ltd :			,, Printing and Stationery ...		28 8 0
Current Account ...	899 2 9		,, Postage ...		24 5 9
Savings Bank Deposit a/c ...	1,725 14 8		,, General charges ...		38 10 0
Cash on hand ...	8 10 6	2,633 11 11	,, Travelling Allowance ...		50 0 0
,, Subscriptions ...		910 0 0	,, Bulletin a/c ...		3,039 8 3
,, Interest on Bank Deposits ...		85 10 8	,, Balance :		
,, Bulletin a/c :			With the Indian Bank Ltd. :		
Amount received on account of advertisements, etc. ...		2,246 10 0	Current a/c ...	466 0 1	
			Savings Bank Deposit a/c ...	1,804 5 3	
			Cash on hand ...	105 11 3	2,376 0 7
Total ...		5,876 0 7	Total ...		5,876 0 7

Examined and found correct.

No. 5, ERRABALU CHETTY STREET,
Madras, 1st June 1932.

K. GOPALAKRISHNA RAO,
Government Diplomæd Accountant, Auditor.

L. JACOB (MRS.)
C. R. KRISHNASWAMI,
Secretaries.

BULLETIN

OF THE

SOUTH INDIAN MEDICAL ASSOCIATION.

JULY 1932.

Tetanus.

C. R. Krishnaswami, M.B., B.S.

Historical Notes.—Tetanus is an Acute Infectious disease caused by *B. Tetani* and characterized by tonic contractions of muscles of different groups increasing in its severity on the most trivial stimuli like a touch of the nose or a noise in the room or a draught from the window.

The specific agent of Tetanus, *B. Tetani* was discovered by Nicolaier in 1885 from garden soil and then further investigated in pure cultures by Kitasato. Rosenbach first cultivated the same bacillus in pure cultures from a wound in a man who died of Traumatic Tetanus. Since then its specific character has been established beyond doubt by numerous investigators.

Tetanus occurs spontaneously in various domestic animals, most often in horses, more rarely in cows and sheep.

It is also supposed to have been grown from the bowels of men.

The incubation period ranges from 1 to 14 days.

Slow onset of symptoms is a favourable sign. What is the index of the rate of onset ? It is the length of time between the first symptom of illness and the first severe generalized spasm. When this period is three days or more the prognosis is good and when it is two days or less, the prognosis is grave.

In the last war, this disease was greatly met with during the trench warfare in intensively cultivated areas.

Further this disease developed after secondary operations in gunshot wounds evidently due to the activation of dormant spores.

When spores themselves are injected experimentally in an animal, they often fail to kill the animal, unless there is a good deal of destruction of tissues round about the site of injection. When vegetative organisms are injected, they are very virulent.

Pathology.—In Tetanus as in Diphtheria, the bacilli remain at the site of infection, while the toxins are absorbed and produce the general symptoms. The toxins are absorbed by the motor end-plates of nerves in muscles and passed to the spinal cord and the brain through the lymphatic channels in perineurium and epineurium. *Pari passu* with this circulation of the toxin, some of it is absorbed into the blood from which it is picked up by the motor end-plates of the nerves in *other* parts of the body from which again the toxins travel up the lymphatics in the epi- and peri-neurium. It is this secondary mechanism which is responsible for the development of the general as opposed to local tetanus and it is by interfering with this mechanism that the prophylactic use of the antitoxin is so efficacions (Boyd).

On reaching the cord, the toxins become anchored to the motor ganglion cells for which these toxins seem to have a special affinity. This selective localization in the cells of the central nervous system is so firm that it is very difficult to dislodge the toxins when once they have got fixed to them. When antitoxin is present in the blood at the time of the introduction of the Tetanus toxin, the antitoxin combines with the toxin in such a way as to divert it from the cells of the central nervous system.

This fact has a definite bearing on the treatment. " Antitoxin introduced after the appearance of the symptoms is ineffectual " (P. 463, Nelson's Loose Leaf Surgery, Vol. I.) But, as Ashurst

has emphasized, it can be shown clinically that antitoxin treatment is of undoubted value even after the development of the symptoms (Boyd.)

Have we any known clinical method by which we are able to assess even approximately the amount of fatal union that may have taken place between the toxin of *B. Tetani* and the central nervous system? No, unless we take the index of the rate of onset. Otherwise, the position, at present, is that if a case recovers by antitoxin treatment, one can say that the case was attended to before the fixation of the toxins with the cells of the central nervous system and if the case ends fatally, the antitoxin injection was not able to dislodge the toxin already fixed with the cells of the central nervous system.

It was argued therefore that an *intrathecal* injection was useless when once the fatal selective localization of the toxins of *B. Tetani* has taken place in the nervous system, and that it was unnecessary if such localization has not taken place, as an intravenous injection will be equally, if not more effective.

In one of the January numbers of the *B. M. J.* of this year, in the epitome of the Current Medical Literature, it was stated that injections of A. T. serum into the cisterna under chloroform anaesthesia were more effective than without chloroform. As the very severe opisthotonus in a pronounced case of tetanus rendered a lumbar puncture difficult without general anaesthesia, I had resorted a good deal to cisternal puncture and injection of A. T. serum therein, without using chloroform, after the withdrawal of a corresponding amount of C.S. fluid.

The significance of the use of chloroform in the cases was not appreciated by me till my attention was drawn by Major V. Mahadevan to a summary of the treatment of tetanus in the March number of the Clinical Journal. "The preliminary anaesthesia by chloroform impregnated the lipoids of the nervous system and so prevented fixation by the toxins. In other words, the chloroform acted as a protective or phylactic agent. Chloroform, because of its affinity for lipoids, does indeed displace toxins already fixed to the lipoids of the nerve cells. These toxins must be at once neutralized by large doses of antitoxins. It seems that, when a patient is gravely ill from severe Neuro-toxin, such as tetanus, the best method of phylaxis is to inject large doses of antitoxin under chloroform anaesthesia." (Clinical Journal.)

Side by side with the injection of A. T. serum, Major V. Mahadevan uses this valuable adjunct, by asking one of the attendants of the tetanus patient to pour a few drops of chloroform on a mask and placing it on the patient's face every now and then to relieve the acuteness of the spasms and the consequent exhaustion. There is not the least doubt that this method relieves the suffering of the patient, but how far it is curative as a phylactic agent it is difficult to assess exactly, seeing that in a bad case with the idea of saving the patient's life, we use many methods of combating the infection.

I must here express my sense of deep gratitude to Major Mahadevan for allowing me the privilege of reviewing the tabulated statement of 25 cases treated by him. I have also appended the statement of 25 cases of mine, treated during the course of last year.

Boyd quotes Bruce's figures of 19% mortality in his series. There was a mortality rate of 5·3 in Mahadevan's series while there was a 25% in mine. (The cases that were admitted moribund, both in Mahadevan's as well as in mine, were omitted in the calculation of mortality statistics.)

" The following old classification of tetanus from a prognostic point of view is very reliable.

i. *Hyper acute Tetanus*, when the signs and symptoms appeared within a few hours after some injury or operation interference.

ii. *Acute* when the symptoms appear within 48 hours.

iii. *Subacute* when some days elapsed before the early signs appeared.

iv. *Chronic* in which the symptoms did not appear till some weeks after the injury." (Med. Annual, 1928, Sir Cuncey de Wheeler).

Mortality rates in any series which is likely to be composed of cases belonging to the different groups, are not helpful unless they are given for each group.

There are various factors which influence the prognosis in tetanus :—

i. The shorter the incubation period, the severer the disease and graver the prognosis.

ii. Prognosis is worse in those cases of tetanus accompanied with fever than those without it.

iii. The nearer the wound to the central nervous system, the graver the prognosis.

Case 3 of my series was complicated with high fever and sepsis and the patient died after 48 hours stay in the hospital when 14,000 units of A. T. serum intracisternally and 7,000 units intramuscularly were given.

Case 6 was admitted with high temperature and a very septic wound in the foot and the patient died after a few hours stay in the hospital when 12,000 units were given intracisternally. The average stay of all the fatal cases in the hospital was 24 hours. Similarly in Mahadevan's series the end in the fatal cases occurred in or about 24 hours after admission.

Infected wounds.—In my series only 7 had infected wounds and the remaining 18 had no apparent focus of infection. What is the portal of entry of the toxin in these 18 cases? Could the infection have occurred from the patients own intestinal tract ? Only a bacteriologist can solve the problem. Could it be possible that in these cases with no apparent infected wound, there could have been only a minute pin-prick (Infection) which might have escaped notice ? Not likely.

The common understanding on the subject is that *B. Tetani* being an anaerobe grows and multiplies only in those wounds infected also by the aerobes like the ordinary septic organisms, which consume all the oxygen available in the tissues, thus making the environments for *B. Tetani* favourable for growth. Or could it be that there had been in the distant part a tiny tetanus infected wound when the bacilli had got into the spore stage and at the time of manifestation of the disease, had got into a stage of activation? In obvious cases of Tetanus with an infected wound, there is first a local Tetanus, *i.e.*, a rigidity of the muscles in the neighbourhood of the wound, which spreads on to more distant groups of muscles, when the disease becomes more definitely established. Local Tetanus is more markedly seen in persons who have had a prophylactic injection of A. T. serum.

In cases of Tetanus with no obvious wound, thinking that the infection may have originated from some wound too tiny to be noticeable, I went about carefully examining for any local assymmetrical rigidity of muscles, but without any success. Probably the cases that came under my observation were in the late stages when the rigidity had become more generalized.

Two cases, *i.e.*, case 6 of Mahadevan and case 20 of my series call for some comment. In both of these the original wound was over looked, but the treatment of Tetanus carried on in the usual manner. These cases improved up to a certain stage, the rigidity in certain groups of muscles persisting,

more especially in those groups in whose vicinity was the wound, which was originally overlooked. In Mahadevan's case, he had to enlarge the wound liberally, cauterize and then continue another course of treatment, till there was complete recovery. In my own case after the improvement in the first few days, the patient complained of a little rigidity in the leg muscles (Lt.). On careful examination on the table, a small wound in the sole of the foot was noticed. On enlarging the wound under general anaesthesia, a thin splinter of wood one inch in length was found deeply embedded in the foot. Nothing more was done than removing the F. B. and laying bare the wound. Unlike in Mahadevan's case this patient received only 3,000 units of A. T. serum for complete recovery, subsequent to this minor surgical procedure.

Does successful treatment of Tetanus in a person confer a subsequent immunity against Tetanus? The experience of case I in my series prompts me to give the answer in the negative. This was an Anglo-Indian boy aged 11 years who was treated successfully for Tetanus ten years ago at the General Hospital. There could not be any doubt about the former diagnosis at the hospital as the grandmother, a very intelligent lady, who accompanied the boy, was positive about the line of treatment carried out at the General Hospital. This boy received 63,000 units of A.T. serum in my wards before complete recovery.

In Mahadevan's series the following line of treatment was followed :—6,000 units of A.T. serum intravenously and 6,000 units intramuscularly on the first day with 3,000 units intravenously and 3,000 units intramuscularly on the subsequent five days, along with intermittent chloroform inhalation.

I have been giving 12,000 units intrathecally, 6,000 units intravenously and 6,000 units intramuscularly on the first day with a minimum of 10,000 or 12,000 units every subsequent day till the severity of the spasms subsided.

Wheeler gives 8,000 units intramuscularly and 16,000 units intrathecally on the 1st and 2nd day and 4,000 units intramuscularly and 8,000 units intrathecally on 3rd and 4th day and 2,000 units intramuscularly on 5th, 7th and 9th days.

Leslie Cole gives much higher doses intravenously going up 70,000 units on the first day following up on succeeding days with proportionately large doses of serum intravenously and intramuscularly according to the severity of the disease.

S. O. Freedlander gives with the first 24 hours 100,000 units of antitoxin intravenously divided into three to five injections, followed by 15,000 to 150,000 units intravenously on subsequent days according to the severity of the condition.

The Tetanus Committee during the war did not approve of the intravenous route as the risk of anaphylaxis was great.

I always did a preliminary test for anaplylaxis by injecting a small dose intradermally and also by injecting a very small dose of serum diluted to 1 in 50 intravenously and watching for any signs of anaphylaxis. Thus far I had noticed no ill-effects due to anaphylaxis in any of my cases.

The rationale of the intravenous route depends on the fact that Tetanus toxin appears early in the blood stream and it is from here that it is taken up by the motor nerve endings.

I should resort to intrathecal route if there is likelihood of any risk due to anaphylaxis by the intravenous route.

Recently I was asked by one of my colleagues in the Hospital if I am getting better results with intracisternal injections and if so whether I will advocate intrathecal or intracisternal administration of the serum as a routine procedure. It is too early for me to give the answer one way or

other. I am resorting now less to intrathecal route and more to intravenous administration of A. T. serum.

Summary.—1. A minimum of 60,000 to 70,000 units of A. T. Serum is needed to cure a case of Tetanus.

2. The system must be loaded, at the earliet manifestation of the disease, with A. T. serum both by intravenous and intramuscular routes.

3. Intrathecal administration must be resorted to, if intravenous serum disagrees with the patient.

4. The intermittent inhalation of chloroform as a phylactic agent, is also of use.

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Major Mahadevan's series of cases treated at Guntur in 1928 and 1929.

No.	Age	Sex.	Duration of illness.	Result.	Stay in the Hospital.	Remarks.
1928	yrs.					
1	28	M	Two days	Cured	19 days	
2	8	F	Two days	Cured	7 days	
3	12	M	Three days	Cured	14 days	
4	30	F	One day	Cured	11 days	
5	30	F	...	Cured	3 days	
6	40	M	One day	Cured	16 days	Ulcer cauterized.
7	5	F	Two days	Died	2 days	Refused treatment.
8	13	M	Five days	Died	1 day	Admitted moribund.
9	20	M	Five days	Cured	19 days	
10	50	F	One day	Died	3 days	
11	30	M	...	Died	1 day	Admitted moribund.
12	7 months.	F	...	Died	2 days	Admitted moribund.
13	40	M	...	Cured	9 days	
14	25	F	One day	Cured	6 days	Injury head.
15	4	M	One day	Died	1 day	Admitted moribund.
16	20	F	Five days	Cured	23 days	
17	25	M	Five days	Cured	15 days	
18	65	M	Four days	Cured	...	
19	28	M	...	Cured	20 days	
20	8	F	...	...	7 days	Discharged at the request of the party—Relieved.
21	12	M	...	Cured	13 days	
22	26	M	...	Cured	15 days	
23	30	F	...	Cured	...	Still in Hospital.
24	25	M	Five days	Cured	12 days	
25	40	W	Seven days	Cured	14 days	

Each one of these cases also received carbolic solution intramuscularly.

Tabulated Statement of 25 Cases treated in 1931 at the Government Royapuram Hospital.

Number.	Sex.	Age.	Duration.	Antitetanic Serum. Thecal or Lumbar units.	Cisternal.	Intravenous	Intra-muscular.	Total quantity of Serum.	Other treatment.	Result.	Stay in the Hospital.	Remarks.	Site of injury.
I	M	11 years.	3 days.	9,000	...	...	54,000	63,000	Mag. sulph. solution Intramuscular on two occasions.	Cured.	11 days.	History of tetanus two years ago. No wound.	...
II	F	6 ,,	1 day.	9,000	9,000	9,000	44,000	71,000	Mag. sulph. solution once and carbolic solution twice.	Cured.	15 ,,	The patient was cured of tetanus but later on developed pneumonic consolidation with failing heart condition. Small wound.	...
III	F	29 ,,	7 days.	...	14,000	...	7,000	21,000	......	Died.	2 ,,	Had temperature due to puerperal sepsis.	Confinement.
IV	M	20 ,,	1 day.	18,000	...	6,000	9,000	33,000	Carbolic solution on 8 occasions.	Cured.	10 ,,	......	Burns 15 days ago.
V	F	20 ,,	5 days.	9,000	9,000	12,000	45,000	75,000	Mag. sulph. once and carbolic solution 5 times.	Cured.	3 ,,	Patient cured of tetanus and was transferred to Lying in Hospital as she aborted. Wound in the head.	Head injury 5 days back.
VI	F	30 ,,	5 ,,	...	12,000	...	...	12,000	......	Died.	1 day.	Had temperature ...	Had an injury 12 days back.
VII	F	10 ,,	5 ,,	9,000	9,000	12,000	36,000	66,000	Mag. sulph. solution 3 times.	Cured.	26 days.	Attempted Lumbar puncture 3 times. Unsuccessful and hence cisternal puncture. No wound.	...
VIII	M	45 ,,	3 ,,	9,000	18,000	9,000	57,000	93,000	Mag. sulph. solution 9 times.	Cured.	20 ,,	No wound.	...
IX	M	32 ,,	2 ,,	...	...	12,000	12,000	24,000	......	Died.	1 day.	Subnormal temperature. No wound.	...
X	F	35 ,,	...	36,000	...	...	45,000	81,000	Mag. sulph. solution 13 times.	Cured.	13 days.	Irregular temperature attributable to mag. sulph. injection. No wound.	...

XI	M	22 ,,	4 days.	9,000	6,000	...	6,000	21,000	Mag. sulph. solution once.	Died.	2 ,,	Temperature on admission ...	...
XII	M	23 ,,	1 day.	12,000	...	...	18,000	39,000	Mag. sulph. solution 5 times.	Cured.	10 ,,	9,000 units was injected round the Brachial Plexus of nerves. Wound in the Thumb.	Hand injury.
XIII	F	10 ,,	3 days.	12,000	...	...	44,000	54,000	Mag. sulph. solution 8 times.	Cured.	23 ,,	No wound ...	...
XIV	M	60 ,,	1 day.	9,000	...	...	9,000	18,000	......	Died.	1 day.	No temperature. No wound.	...
XV	...	...	...	...	...	...	500	500	......	Died.	1 ,,	Admitted with unconsciousness in the evening and had only 500 units given on admission. Died next morning. No wound.	...
XVI	M	24 years.	7 days.	15,000	...	...	36,000	51,000	Mag. sulph. solution twice.	Cured.	19 days.	No wound ...	...
XVII	M	28 ,,	6 ,,	9,000	...	...	12,000	21.000	Mag. sulph. solution once.	Died.	2 ,,	No trismus but marked rigidity of muscles of the arm, and abdomen. No wound. No temperature.	...
XVIII	M	25 ,,	2 ,,	9,000	...	...	16,000	25,000	Mag. sulph. solution once.	Died.	3 ,,	Rigidity of muscles of lower extremity along with frequency of spasm. Trismus. No temperature. No wound.	...
XIX	M	2 ,,	...	15,000	...	3,000	82,000	100,000	......	Cured.	12 ,,	No wound ...	...
XX	M	11 ,,	11 days.	15,000	...	15,000	99,000	129,000	......	Cured.	12 ,,	Local wound treated in the latter half of the stay in the Hospital. Wound in the foot. Splinter of wood removed.	...
XXI	M	24 ,,	3 ,,	12,000	...	12,000	6,000	30.000	......	Died.	1 day.	......	...
XXII	F	...	8 ,,	6,000	...	2,000	...	8,000	......	Died.	2 days.	No temperature. Subsequent temperature may be due to intravenous and intrathecal injection.	...
XXIII	F	20 years.	...	...	...	9,000	...	9,000	......	Died.	1 day.	......	...
XXIV	M	3 ,,	...	3,000	...	...	72,500	75 500	Mag. sulph. solution 3 times.	Cured.	23 days.	......	...
XXV	M	50 ,,	7 days.	33,000	...	30,000	108,000	168.000	Mag. sulph. solution 5 times.	Cured.	19 ,,	......	...

EXTRACTS.

Medicine.

CLINICAL DIAGNOSIS OF BUNDLE-BRANCH BLOCK.

King and McEchern.

(*American Journal of Medical Sciences April 1932.*)

Bundle-branch block is not an uncommon disorder of conduction (10 per cent of cardiac cases) and is liable to be overlooked in the absence of arrhythmia unless an electrocardiagram is obtained. It would be a distinct advantage to be able to diagnose bundle-branch block at the bed side like other arrhythmias.

Physical Signs are elicited by ordinary methods of physical diagnosis. They are :—

(1) Visible apical reduplication.

(2) Palpable apical reduplication.

(3) Auscultation.

(*a*) Reduplication of first sound at apex.

(*b*) Asynchronous systolic murmurs.

(*c*) Single first sound and separated systolic murmur.

Of the above (1) and (2) are more helpful than auscultatory findings, though faint or indeed inaudible sounds at the beginning of systole are helpful.

Differential Diagnosis.—To establish a clinical diagnosis, the entire group of physical signs must be considered.

(1) *Presystolic gallop rhythm.* On inspection and palpation *presystolic gallop* is indicated by an apparently presystolic, apical lift or shock preceding a ventricular impulse that is normally sustained ; intraventricular block causes a split in the main ventricular lift. Thus the adventitious impulse in presystolic gallop is comparatively slight and early, in intraventricular block it is late and follows the main systolic thrust.

On auscultation, presystolic gallop causes a sound preceding a first sound that is usually vigorous or that is replaced by a vigorous murmur; in most cases of intraventricular block, the sounds begin with systole and consist of two faint sounds replacing the usual single first sound: either this is heard or the sounds are inaudible or replaced by one or two murmurs.

Marked hypertention is almost always associated with presystolic gallop which is helpful in diagnosis.

There is strong evidence that there is no necessary relationship between auricular contraction and the physical signs of intraventricular block.

The electro-cardiographic findings in bundle-branch block are :—

(1) Prolongation of the intraventricular conduction time to 0·10 second or beyond.

(2) Slurring or splintering of the *Q.R.S.* complexes.

(3) A predominent laevogram or dextrogram.

(4) *T.* waves of opposite sign to the main ventricular deflection in Leads I and III.

Surgery.

THE SURGICAL TREATMENT OF INTRATHORACIC NEW GROWTHS.

A Resume of a Lecture delivered at the Bath Branch of the B.M.A. by A. Tudor Edwards.

Tumours of the thorax may be Benign or Malignant. They may be divided into three main groups: 1. Pleural. 2. Mediastinal. 3. Pulmonary.

Pleural Tumours.

A. Benign.
B. Malignant.

A. *Benign tumours* really arise from tissues adjacent to the pleura.

Varieties.—Fibroma, Lipoma, Chondroma, and Ganglion neuro-fibroma.

Symptoms.—(*a*) Pain-localized and persistent according to the size of the tumour. (*b*) An irritating cough without much expectoration. (*c*) Horner's Syndrome—Enophthalmos.

Signs.—(1) An area of localized dullness with diminution of breath-sounds. (2) Evidence of external tumour—most common in chondroma and Ganglion neurofibroma. (3) Radiological examination. (4) The production of artificial pneumothorax will help to differentiate its origin.

B. *Malignant pleural tumours, e.g.*, Diffuse endothelioma (the localized endothelioma is rare) generally arise as plaques. Haemorrhagic effusions usually present. Aspiration of the fluid and replacement by air and radiography will reveal irregular growths on the surface of the pleura.

Treatment.—Deep X-ray therapy and application of a big Radium plaque is of some benefit.

Mediastinal Tumours.

A. *Benign.*

(1) Intrathoracic Goitres.

(2) Dermoids and teratomata.

Symptoms.—(*a*) the most characteristic symptom is dyspnoea. (*b*) cyanosis of the head and neck. (*c*) engorgement of the veins of the head and neck.

Signs.—(*i*) an area of dullness on percussion over the sternum. (*ii*) an oblique view skiagram (one of great importance) may show displacement of trachea either laterally or forward.

Treatment.—Mediastinal thyroids should be removed by the usual low collar incision. Haemorrhage into the tumour is quite likely to cause sudden respiratory obstruction, and hence the necessity of an early operation. If there is not sufficient room to deliver the goitre through the upper aperture of the thorax, splitting of the sternum in the middle line down to the third space together with a transverse incision outwards, should be undertaken.

Dermoids and Teratomata.—As long as they are mediastinally situated they do not cause symptoms. But they tend to dissect outwards between the lobes of the lungs. Two groups of symptoms are noted :—

1. Symptoms are absent till the mass reaches the parietal pleura, whereupon it gives rise to pain and dyspnoea and other signs and symptoms of pleurisy.

2. In this group the symptoms are associated with irritation of the bronchus due to pressure upon it. Later, perforation of bronchus may bring about a copious discharge along with the contents of the tumour.

Treatment is by removal after exploration, by a transplueral incision either anteriorly or posteriorly according to the site of the tumour.

B. *Malignant Mediastinal Tumours,* e.g., Lymphosarcoma and Lymphoadenoma. Very rapid in their onset and growth.

Signs.—Enlarged glands are often found in the axilla and neck. In lymphoadenoma there is associated enlargement of the spleen and a Pel-Ebstein crisis of temperature.

Treatment.—Deep X-ray therapy appears to be definitely indicated.

PULMONARY TUMOURS.

A. Benign.—These are very rare. Examples are chondroma and osteoma. These are really teratomata which have arisen in the mediastinum and subsequently insinuated themselves between the lungs. Hydatids belong to this group. Operative treatment is possible in certain types of cases.

B. Malignant.—Primary carcinoma may arise in the large bronchi and the bronchioles or the alveoli. They are of the squamous-celled or of the cuboidal-acinar type. These are generally symptomless except for dyspnoea which is present from the earliest stages. Small haemoptysis is also an early sign in some cases. The diagnosis is confirmed by the introduction of Lipiodal, when there may be seen complete or partial obstruction of a bronchiole.

The treatment of primary carcinoma by deep X-ray therapy is disappointing. The most encouraging results are noted on introduction of Radon seeds by means of containers either into the growth or in its neighbourhood. 1·5 or 1·8 millecurie seeds are retained in situ for five or eight days.

OTHER MALIGNANT CONDITIONS.

Endothelioma arises as a more peripheral growth, occasionally it has been possible to compeletly extirpate the growth by a lobectomy.

Sarcoma of the lung is very rare and the outlook is always very bad.

Secondary malignant disease will rarely justify operative interference, since the secondary deposits in the lungs are usually multiple and bilateral.

CORRESPONDENCE

Bombay "Medical Libel" Case.

Dr. Madanlal N. Talati has done a public service to the licentiates in having instituted a libel case against Sir N. Choksey. He has lost the case. The trying Magistrate held the view that since it was admitted on all hands that the qualification of the licentiates is inferior to that of the grauduates it was therefore not defamatory for the respondent to say that the licentiates were lowering the standard of medical practice in towns and big cities. If only the Magistrate had judged the standard of practice of the licentiates, not by their qualification alone, but by the prevailing standard among the average graduate practitioners in Bombay he would have come to a different conclusion. It is preposterous to say that because an M. D. is better qualified than a M. B., ergo the latter's standard of practice is qualitatively lower than that of the former. A degree or a diploma is after all a legal passport to practise; the standard of practice is evolved by and is adhered to by the various members of the profession irrespective of their academic qualification.

It seems that Dr. Choksey belongs to a small group of medical men in Bombay who are against the inclusion of the licentiates in the All-India medical register. It is contended by him and those whom he represents—we wonder whether they are many—that their inclusion will place them on the same footing as the holders of the Indian and British University degrees and entitle them to exercise the same rights and privileges as the latter therefore they ought not to be included. He is certainly entitled to hold such views and advocate them through press and platform for the edification of the Public. We do not quarrel

with him on this count. But when he writes "unfortunately it so happens that the majority of licentiates have settled down to practise in towns and big cities lowering the standard of practice in those places through unhealthy competition" we must differ from him.

May we request Dr. Choksey to answer the following few questions?

(1) Are not the licentiates included at present in the provincial registers and do they not thereby enjoy the rights and privileges of registered practitioners?

(2) Has this inclusion in any way lowered the degree-holders in the estimation of the public or of the profession, in spite of their association with the licentiates in the medical council?

(3) If it has, why has he not protested till now against the inclusion of the licentiates in the provincial medical register?

(4) If it has not, why does he now raise a new controversy of peril to the profession and to the graduates by their probable inclusion in the All-India register?

(5) What is the average standard of medical practice of the graduates in Bombay and in what way is that of the licentiates inferior to them?

(6) Does he mean to imply that if the licentiates withdraw from the cities the standard of medical practice will automatically improve in those places?

(7) Does he mean to imply that the standard of the licentiates is sufficient for rural parts and not for a city?

The plain truth is that "the standard of practice" is a shibboleth. If the graduates are not able to stand competition with the licentiates in the city, it must be due to the inexorable law of survival of the fittest over which, fortunately, the medical Knight of Bombay has no control. We shall suggest however one method to relieve his embarrassment; and that is, let him influence his friends in the legislature to bring an Act debarring the licentiates from practising in "towns and big cities". He will then know how the wind blows.

The Bombay medical council is the best authority to judge the standard of practice of the practitioners there. We suggest to Dr. Madanlal to seek its counsel and to know from that body whether it is not a breach of professional ethics and professional misconduct if one of its registered members chooses to write to the lay press alleging as Dr. Choksey has done that the lowering of the standard is brought about by unhealthy competition, result of the majority of licentiates (registered in the Bombay Medical council) settling in "towns and big cities."

U. D. GOPAL RAU,
Secretary, Madras Branch of The All-India Medical Licentiates, Association,

A. VISWANATHAN,
Associate Editor, Indian Medical Journal.

APPOINTMENTS.

The Government are pleased to appoint the following persons to be Honorary Medical Assistants in the various Hospitals :—

Assistant Physicians.

Mr. K. P. G. Menon, L.R.C.P.S. (Edin.), L.R.F.P.S. (Glas.), L.M. (Dublin), M.R.C.P. (Edin.), (Obstetric), Government Headquarters Hospital, Coimbatore.

Mr. B. S. Viswanathan, L.M.S. (Tuberculosis), Government Headquarters Hospital, Coimbatore.

Mr. P. Manickaraju, B.A., M.B.B.S., King George Hospital, Vizagapatam.

Assistant Dermatologist.

Mr. S. Rajagopalan, L.M.S., Government General Hospital, Madras.

Assistant Bacteriologist.

Mr. P. Murugesam, L.M.P., Tuberculosis Institute, Madras.

Clinical Assistants.

Mr. V. Govindarajulu, M.B.B.S., Government Royapuram Hospital, Madras.

Mr. M. Sambasiva Rao Naidu, M.B.B.S., Government Royapuram Hospital, Madras.

Mr. P. Satyanarayana, L.M.S., Government Headquarters Hospital, Berhampur.

Miss Ratnappa, L.M.P., Government Headquarters Hospital, Cocanada.

Mr. Mahomed Moienuddin, L.M.P., Government Headquarters Hospital, Cocanada.

Mr. P. Seshagiri Rao, L.M.P., Government Hospital, Gudivada.

Mr. P. Vadamalayan, M.B.B.S., Government Headquarters Hospital, Madura.

Mr. H. J. Masilamani, Government Headquarters Hospital, Madura.

Mr. W. Damodara Nambiyar, L.M.S., Government Hospital, Cannanore.

Mr. M. Krishnan, L.M.P., Government Hospital, Tellicherry.

Miss R. A. Jacob, L.M.P., Government Hospital, Anakapalle.

Mr. Y. Venkataramanamurthi, L.M.S., King George Hospital, Vizagapatam.

Mr. J. Jagannathan, M.B.B.S., King George Hospital, Vizagapatam.

Assistant Surgeons.

Mr. R. Lakshmanan, M.B.B.S., Government Headquarters Hospital, Vellore.

Mr. R. M. Patnaick, L.M.S , Government Headquarters Hospital, Berhampur.

Mr. T. Satyanarayana Murti, L.M.S., (Ophthalmic) Government Hospital, Narasapur.

Mr. T. Baskara Rao, L.M.S., (Ophthalmic) Government Hospital, Tanuku.

Mr. A. F. Coelho, M.B.B.S., (Diseases of Skin), Government Wenlock Hospital, Mangalore.

Miss F. M. Hart, M.B.B.S, Government Hospital, Bezwada.

Mr. D. Kameswara Rao, M.B.B.S., D.G.O., Government Hospital, Bezwada

Mr. P. Achutha Menon, L.M.S., Government Hospital, Ponnani.

Mr. I. Govindakutty Menon, M.B.B.S., Government Hospital, Cochin.

Mr. A. N. Subbaraman, M.B.B.S., Government Hospital, Palaghat.

Mr. T. K. Narayanan, L.M.S., L.O., Government Hospital, Tellicherry.

Mr. C. Kesava Menon, M.B.B.S., Government Headquarters Hospital, Calicut.

Mr. S. Krishnamurthi Rao, M.B.B.S., Government Headquarters Hospital, Salem.

Mr. K. Hariharaswami, M.B.B.S., King George Hospital, Vizagapatam.

Mr. R. Kondala Rao, L.M.S., (Leprosy Clinic), Government Hospital, Anakapalle.

Dr. Mrs. S. Achar, M.B.B.S., D.G.O., Raja Mirasdar District Headquarters Hospital, Tanjore.